

JOURNAL OF **MODERN  
OPTICS**

formerly Optica Acta

**VOLUME 42**

**January to December 1995**



Published in accordance with  
the guidelines of  
the European Physical Society



Taylor & Francis  
London • Washington, DC

QC  
350  
.053

# JOURNAL OF MODERN OPTICS

## Board of Editors

<b>P. L. Knight</b> (Editor)	Optics Section, Blackett Laboratory, Imperial College, London, SW7 2BZ, UK
<b>R. W. Boyd</b> (North American Editor)	The Institute of Optics, University of Rochester, Rochester, New York 14627, USA
<b>S. M. Barnett</b>	University of Strathclyde, Glasgow, UK
<b>O. Bryngdahl</b>	Universität-Gesamthochschule, Essen, Germany
<b>K. Burnett</b>	University of Oxford, UK
<b>N. Doran</b>	University of Aston, Birmingham, UK
<b>W. J. Firth</b>	University of Strathclyde, Glasgow, UK
<b>V. S. Letokhov</b>	Institute of Spectroscopy, Academy of Sciences, Moscow, Russia
<b>H. A. Macleod</b>	University of Arizona, Tucson, Arizona, USA
<b>D. Maystre</b>	Faculté des Sciences et Techniques de St Vérôme, Marseille, France
<b>G. M. Morris</b>	University of Rochester, Rochester, New York, USA
<b>F. Persico</b>	Istituto di Fisica dell'Università degli Studi, Palermo, Italy
<b>J. G. Rarity</b>	Defence Research Agency Electronics, Malvern, Worcs., UK
<b>J. R. Sambles</b>	University of Exeter, UK
<b>R. M. Sillitto</b>	University of Edinburgh, UK
<b>Shun-ichi Tanaka</b>	Science University of Tokyo, Shinjuku, Tokyo, Japan
<b>A. C. Tropper</b>	University of Southampton, UK
<b>G. Tribillon</b>	Université de Franche-Compte Besançon, France
<b>M. Vaughan</b>	Defence Research Agency, Malvern, Worcs., UK
<b>E. Wolf</b>	University of Rochester, Rochester, New York, USA
<b>F. Wyrowski</b>	Berlin Institute of Optics, Germany

## International Advisory Editorial Board

**L. R. Baker** 21 Long Acre, Orpington, Kent BR6 7RD, UK  
(Chairman and Secretary)

**G. S. Agarwal**, Physical Research Laboratory, Ahmedabad, *India*; **H. H. Arsenault**, Université Laval, Québec, *Canada*; **A. F. Fercher**, Institut für Medizinische Physik, Wien, *Austria*; **H. A. Ferwerda**, University of Groningen, *Netherlands*; **M. Kujawinska**, Polish Academy of Sciences, Warsaw, *Poland*; **Fuchen Lin**, Shanghai Institute of Optics and Fine Mechanics, *China*; **R. C. McPhedran**, University of Sydney, *Australia*; **H. M. Nussenzveig**, Pontificia Universidade Católica do Rio de Janeiro, *Brazil*; **D. T. Pegg**, Griffith University, Brisbane, *Australia*; **J. Peřina**, Palacký University, Olomouc, *Czech Republic*; **L. Ronchi Abbozzo**, Istituto di Ricerca sulle Onde Elettromagnetiche, Firenze, *Italy*; **R. S. Sirohi**, Indian Institute of Technology, Madras, *India*; **R. Ulrich**, Technische Universität Hamburg, Hamburg, *Germany*; **S. Walles**, CelsiusTech Electronics, Lidingö, *Sweden*; **H. Walther**, Max-Planck-Institut für Quantenoptik, Garching bei München, *Germany*.

**CONTENTS OF VOLUME 42****No. 1 January 1995**

- 1 Obituary notice**  
L. Baker
- Letters*
- 3 Binocular disparity and stereopsis obtained under white light with a diffraction grating**  
J. J. Lunazzi and J. M. Jaramillo Ocampo
- 7 Time-resolved optoacoustic detection of absorbing particles in scattering media**  
A. A. Karabutov, N. B. Podymova and V. S. Letokhov
- 13 Turbulent phase screen for the study of imaging system performance**  
J. C. Ricklin, M. A. Vorontsov, G. W. Carhart, D. Gose and W. B. Miller
- Topical review*
- 19 The optics of ferroelectric liquid crystals**  
S. J. Elston
- Papers*
- 57 Influence on the read-out signal of the height profile of the pits (or bumps) on optical discs**  
H. H. Hopkins and C. S. Chung
- 85 Coupled cavity modes**  
C. Reitberger
- 101 Laser instabilities and chaos in inhomogeneously broadened dense media**  
C. M. Bowden, S. Singh and G. P. Agrawal
- 109 Conservation laws for free electromagnetic fields**  
M. W. Kowarz
- 117 Phase sensitivities of optical fibre ring and loop resonators using a non-planar or planar  $3 \times 3$  fibre coupler**  
Y. H. Ja
- 131 A field-momentum approach to the semiclassical theory of light forces on atoms**  
A. V. Durrant, K. E. Hill, S. A. Hopkins and E. Usadi
- 141 Calculation of nonlinear waves guided by optical fibres using the resonance technique**  
J. D. Kannelopoulos and N. A. Stathopoulos
- 157 Scattering matrices for slightly non-spherical particles**  
R. J. Martin
- 171 Cooperative atomic behaviour and oscillator formation in a squeezed vacuum**  
M. R. Wahiddin, S. S. Hassan and R. K. Bullough

- 191 Holographic techniques application in analysing cuneiform inscriptions**  
N. Demoli, H. Gruber, U. Dahms and G. Wernicke
- 197 Non-classical properties of stimulated Raman and hyper-Raman scattering in stationary regime**  
M. Olivík and J. Peřina
- 217 Optical particle trapping with higher-order doughnut beams produced using high efficiency computer generated holograms**  
H. He, N. R. Heckenberg and H. Rubinsztein-Dunlop
- 225 Wave scattering from fractal surfaces**  
N. Lin, H. P. Lee, S. P. Lim and K. S. Lee
- 243 Examination of the  $+1$ ,  $-1$  surface plasmon mini-gap on a gold grating**  
D. J. Nash, N. P. K. Cotter, E. L. Wood, G. W. Bradberry and J. R. Sambles
- 249 Announcements**
- 253 Book reviews**

## No. 2 February 1995

### *Papers*

- 257 Enhanced backscattering due to total internal reflection at a dielectric-air interface**  
R. E. Luna, E. R. Méndez, J. Q. Lu and Z.-H. Gu
- 271 Determination of fractional fringe order by phase shifting in real-time shearography**  
C. W. Sim, F. S. Chau and S. L. Toh
- 279 Some statistical properties of surface heights via remote sensing**  
J. Alvarez-Borrego
- 289 Focusing of a Gaussian Schell-model beam through a circular lens**  
B. Lü, B. Zhang and B. Cai
- 299 An analytical method of vector diffraction for focusing optical systems with Seidel aberrations II: Astigmatism and coma**  
R. Kant
- 321 The Casimir effect in dielectrics. A numerical approach**  
S. J. van Enk
- 339 Polarization effects in electromagnetic wave propagation in a two-dimensional disordered system**  
A. S. McLean and J. B. Pendry
- 367 Digital double-pulsed holographic interferometry for vibration analysis**  
G. Pedrini, Y. L. Zou and H. J. Tiziani
- 375 The damped-vacuum-field Jaynes-Cummings model**  
G. Hu, E. Irwin and P. K. Aravind
- 389 Surface profiling by analysis of white-light interferograms in the spatial frequency domain**  
P. de Groot and L. Deck

- 403 Determination of the parameters of rectangular dielectric waveguides by new effective index methods**  
S. P. Pogossian, H. le Gall, J. Gieraltowski and J. Loaëc
- 411 On the population loss dynamics of a strongly excited four-level system**  
L. Kancheva, E. Popov and G. Georgiev
- 425 Achromatic white-light self-imaging phenomenon: an approach using the Wigner distribution function**  
J. Lancis, E. E. Sicre, A. Pons and G. Saavedra
- 435 Phase properties of the displaced number state in a Kerr medium**  
B. Leng, S.-D. Du and C.-D. Gong
- 447 Angular separation of a pair of sources by spectral interferometric technique**  
H. C. Kandpal, K. Saxena, D. S. Mehta, J. S. Vaishya and K. C. Joshi
- 455 Intensity distribution across a source from spectral measurements**  
H. C. Kandpal, J. S. Vaishya, K. Saxena, D. S. Mehta and K. C. Joshi
- 465 On restoring interference in joint photon counting rate in cascade emission**  
H. Huang and G. S. Agarwal
- 473 Localization of light by a set of parallel cylinders**  
D. Felbacq, D. Maystre and G. Tayeb
- 483 Dynamics of induced lightbeam deflection in an off-axis geometry**  
A. Dreischuh, D. Kavaldjiev and S. Dinev
- 489 Book reviews**

### No. 3 March 1995

#### *Letter*

- 491 Volume integral formulation of finite difference beam propagation method for studying planar optical waveguides**  
P. Chamorro-Posada and F. J. Fraile-Peláez

#### *Papers*

- 497 Reflection/transmission measurements of anisotropic films with one of the principal axes in the direction of columnar growth**  
H. Wang
- 507 Light scattering from homogeneous spheres covered by a film with a variable refractive index**  
L. Kai, Z. Min and A. D'Alessio
- 515 Effects of a moving mass centre on atomic dynamics in locally inhomogeneous quantized cavity field**  
Xiao-Guang Wang and Chang-Pu Sun
- 523 The intensity distribution of a Gaussian Schell-model beam focused by an aperture lens**  
Baida Lü, Bin Zhang and Bangwei Cai

- 541 LP<sub>01</sub>–LP<sub>11</sub> intermodal interference in highly birefringent two-mode fibres with differential LP<sub>11</sub> polarization-mode attenuation**  
T. A. Eftimov
- 565 Ultra-high-frequency beats produced by laser modes at the single-photon level**  
P. Hariharan, N. Brown, I. Fujima and B. C. Sanders
- 569 Squeezing in the thermal Jaynes–Cummings model**  
M. Kozierowski, J. F. Poyatos and L. L. Sánchez-Soto
- 579 Photoexcitation to a periodic continuum**  
P. M. Radmore
- 585 Two-mode squeezed pair coherent states**  
C. C. Gerry
- 607 Edge enhancement, contrast reversal and logic operations using beam fanning in a photorefractive iron-doped barium titanate crystal**  
K. Kamra and K. Singh
- 619 Optical activity of photonic crystals**  
V. Karathanos, N. Stefanou and A. Modinos
- 627 Investigation of aberration measurement in confocal microscopy**  
H. Zhou, M. Gu and C. J. R. Sheppard
- 639 Asymmetry in the diffraction spectrum of a reflection hologram grating**  
D. Liu, G. Manivannan, H. H. Arsenault and R. A. Lessard
- 655 Inverse problems with quasihomogeneous random media utilizing scattered pulses**  
D. G. Fischer and B. Cairns
- 667 Measurement of strains in turbine blades vibrating at resonance using electro-optic holography**  
G. K. Bhat
- 679 Effect of a squeezed vacuum on coherent population trapping in a three-level lambda system**  
M. R. Ferguson, Z. Ficek and B. J. Dalton
- 707 Boson inverse operators and a new family of two-photon annihilation operators**  
A. K. Roy and C. L. Mehta
- 721 Corrigendum. High-sensitivity diffraction-compensated moiré deflectometry**  
S. K. H. Auluck

#### No. 4 April 1995

##### *Letters*

- 723 Femtosecond pulse generation from a synchronously pumped, self-mode-locked Cr<sup>4+</sup>:YAG laser**  
P. J. Conlon, Y. P. Tong, P. M. W. French, J. R. Taylor and A. V. Shestakov
- 727 Multiphoton excitation of Beutler–Fano resonances via Rydberg states**  
N. E. Karapanagioti, G. Droungas and J. P. Connerade

- 739 Dynamics of the generation of the pure two-atom squeezed state**  
M. R. B. Wahiddin, Z. Ficek and S. K. Ng
- Papers*
- 747 Three-dimensional image formation in confocal microscopy under ultra-short-laser-pulse illumination**  
M. Gu and C. J. R. Sheppard
- 763 A method for the optical characterization of thin uniaxial samples**  
F. Yang, G. W. Bradberry and J. R. Sambles
- 775 Effects of even and odd coherent states on the evolution of the two-photon Jaynes–Cummings model**  
A. Joshi and M. Singh
- 787 Radiometry with quasihomogeneous sources**  
J. T. Foley and E. Wolf
- 799 The origin of excess noise**  
G. H. C. New
- 811 A new approach for optimization of wavelength multiplexers with phased waveguide arrays by use of the beam propagation method**  
Z. Nikolov and H.-G. Unger
- 823 Field dependent effects in a quadratic nonlinear medium**  
A. Re, C. Sibilia, E. Fazio and M. Bertolotti
- 841 General expression of light intensity emerging from a linear anisotropic device using Stokes parameters**  
L. Dettwiller
- 849 Performance of an off-axis holographic lens in the presence of aberrations induced by construction–reconstruction wavelength shift: extended object imaging**  
S. Baskar and K. Singh
- 861 Imaging of random surfaces**  
C. J. R. Sheppard and T. J. Connolly
- 883 Single-multiple scattering technique to simulate a time-dependent signal of a pulse laser radar with separately located illuminating and receiving platforms**  
V. Ovod and T. Wriedt
- 895 Influence of light polarization on the behaviour of a resonant cascade laser**  
V. Espinosa, G. J. de Valcárcel, E. Roldán and R. Vilaseca
- 913 Simulations of quantum trajectories using Markov chains**  
W. L. Power
- 925 Near to mid infrared astronomical optics with self-achromatic lenses**  
I. Escudero-Sanz
- 937 Book reviews**

## No. 5 May 1995

*Letters*

- 939 **Bell correlations in phase space: application to quantum optics**  
U. Leonhardt and J. A. Vaccaro
- 945 **Automatic support for consistent labelling of skeletonized fringe patterns**  
A. Colin and W. Osten

*Papers*

- 955 **Examination of focal shifts of modified Gaussian beams under external lensing**  
P. P. Banerjee, C.-R. Lin and M. R. Chatterjee
- 965 **Scalar diffraction by rectangular apertures in a thick screen**  
S.-E. Sandström
- 985 **Switching between Rayleigh-like and Lorentzian lineshapes of the dispersion in driven two-level atoms**  
C. Szymanowski, C. H. Keitel, B. J. Dalton and P. L. Knight
- 1005 **Profiling the mirror surface from the Fraunhofer amplitude distribution that can be generated under coherent illumination**  
C. Saloma and E. Bagarinao, Jr
- 1023 **Pulsed laser written diffraction gratings in liquid crystal polymers**  
S. J. Elston and D. C. Ulrich
- 1037 **Paraxial wave theory of second and third harmonic generation in uniaxial crystals. I. Narrowband pump fields**  
D. Eimerl, J. M. Auerbach and P. W. Milonni
- 1069 **State evolution in the two-photon Jaynes-Cummings model with initial squeezed vacuum and chaotic fields**  
H. T. Dung, E. I. Aliskenderov and L. Knöll
- 1079 **Analysis of waveguide ring lasers with nonlinear directional out-coupler**  
M. A. Karpierz, A. Kujawski and P. Szczepański
- 1093 **Separation of optical thin film and substrate absorption by obliquely-crossed photothermal deflection: Theory**  
Bingcheng Li, Yanzhuo Deng and Jieke Cheng
- 1109 **The interferometer as an optical network**  
P. Törmä and S. Stenholm
- 1123 **Propagation of partially coherent beams in absorbing media**  
C. Palma, P. de Santis, G. Cincotti and G. Guattari
- 1137 **Enhancement of the uniformity and rotation of large aperture, permanent magnet, tunable Faraday rotators**  
G. L. Fischer, T. R. Moore and R. W. Boyd
- 1145 **Spectrum of a micromaser with Kerr nonlinearity**  
B. Deb and D. S. Ray

## No. 6 June 1995

*Letters*

- 1155 **Multi-user quantum cryptography on optical networks**  
S. J. D. Phoenix, S. M. Barnett, P. D. Townsend and K. J. Blow
- 1165 **Quantum theory of a dielectric-vacuum interface in one dimension**  
S. M. Barnett, R. Matloob and R. Loudon

*Papers*

- 1171 **Eliminating the influence of the perturbed reference wave in electron holography**  
Leigang Kou and Jianwen Chen
- 1179 **The 2<sup>n</sup>-element number neural network model: recognition of the multistate patterns**  
J. W. Shuai, Z. X. Chen, R. T. Liu and B. X. Wu
- 1189 **Length-dependent static-properties of Nd-doped fibre-lasers: optical feedback effects**  
B. Meziane, F. Sanchez, G. M. Stephan and P. L. François
- 1199 **Multiphoton Jaynes-Cummings model without the rotating-wave approximation**  
M.-F. Fang and P. Zhou
- 1213 **A quadratic adaptive method for aberration correction**  
C. C. Hull and J. Maxwell
- 1231 **Algorithm for the generation of non-diffracting Bessel modes**  
V. V. Kotlyar, S. N. Khonina and V. A. Soifer
- 1241 **Critical edge characterization of the optical tensor of a uniaxial crystal**  
F. Yang, G. W. Bradberry and J. R. Sambles
- 1253 **Dense coding based on quantum entanglement**  
A. Barenco and A. K. Ekert
- 1261 **Transverse pattern formation in optical parametric oscillators**  
K. Staliunas
- 1271 **A new approach to surface deformation measurement from phase-stepped holographic fringes**  
C. Quan, H. M. Shang, C. J. Tay and P. J. Bryanston-Cross
- 1281 **Conical diffraction from uniaxial gratings**  
M. L. Gigli and R. A. Depine
- 1301 **Output characteristics of an optical fibre ring resonator using a planar or nonplanar 3 × 3 fibre coupler: a comparison**  
Y. H. Ja
- 1311 **Density matrix elements and moments for generalized Gaussian state fields**  
G. Adam
- 1329 **Second-harmonic generation efficiencies in germanium-doped planar waveguides: a normal-mode analysis**  
I. Dajani

- 1343 Diffraction grating characterization using multiple-wavelength excitation of surface plasmon polaritons**  
E. L. Wood, J. R. Sambles, N. P. Cotter and S. C. Kitson
- Short communication*
- 1351 Nonlinear response of photopolymers for holography: copolymerization process**  
A. Fimia, L. Carretero and A. Beléndez

## No. 7 July 1995

### *Letters*

- 1355 The inverted surface plasmon resonance: further discussion**  
R. Bussjager and H. A. Macleod
- 1361 Analysis of the EZ scan measurement technique**  
S. V. Kershaw
- Papers*
- 1367 Image restoration using a Lorentzian probability model**  
A. H. Lettington and Q. H. Hong
- 1377 Multimode coherent states**  
I. Jex, P. Törmä and S. Stenholm
- 1387 Holographic diffusers: diffusers with low backscatter**  
S. Wadle and R. S. Lakes
- 1397 The effect of phase fluctuation on electromagnetically induced transparency, inversionless lasing and refractive index enhancement in a  $\Lambda$  system**  
S.-Q. Gong, Z.-Z. Xu and S.-H. Pan

- 1407 Coherence of light at the output of a fibre waveguide analysed in the space-frequency domain**  
P. Hlubina
- 1427 Optimization of tetragonal  $\text{KTa}_{1-x}\text{Nb}_x\text{O}_3\text{:Fe}$  crystals as storage materials for double-exposure holographic interferometry**  
S. Riehemann, S. Loheide and G. Von Bally
- 1439 Useful algorithms to derive the optical properties of clouds from a back-scatter lidar return**  
S. Elouragini
- 1447 A simple optical procedure for characterizing uniaxial media**  
F. Yang, J. R. Sambles and G. W. Bradberry
- 1459 Autocorrelation central hole in clipped photon-counting detection. Estimation from the zero-count probability density**  
M. P. Cagigal and P. Prieto
- 1467 Evaluation of planar fractal images by optical autocorrelation**  
A. Dogariu, J. Uozumi and T. Asakura
- 1485 Laser-near-field-based atomic lens: quantum wave optics consideration**  
V. V. Klimov and V. S. Letokhov

- 1505 Phase properties of a strong field interacting with many atoms with and without initial atomic coherences**  
X. M. Hu
- 1517 Quantum-statistical properties of a nonlinear asymmetric directional coupler**  
J. Peřina
- 1523 Bispectral imaging through unknown deterministic aberrations**  
D. T. Miller, Doo Jin Cho, G. M. Morris and D. R. Williams
- Short communication*
- 1547 On the interaction of two-level atoms with superpositions of coherent states of light**  
H. Moya-Cessa and A. Vidiella-Barranco
- 1553 Book review**

### No. 8 August 1995

#### *Papers*

- 1555 Non-diffractive vector Bessel beams**  
Z. Bouchal and M. Olivík
- 1567 Isotropization length for random walk models of photon migration in turbid media**  
G. H. Weiss, A. H. Gandjbakhche and J. Masoliver
- 1575 Analytic solutions of the eikonal equation for a GRIN-rod lens. 2. Skew rays**  
T. Sakamoto
- 1593 Diffraction analysis of the segmented wedge array line focus geometry illuminated by partially coherent light**  
B. Lü and B. Zhang
- 1603 Electromagnetic resonance at the interface of two concentric spheres**  
L. Kai and A. D'Alessio
- 1611 Generalized analytical solutions for planar and non-planar focal curves reconstruction**  
Z. Jaroszewicz, A. Kolodziejczyk and D. Mouriz
- 1631 Spectral asymmetry by group velocity dispersion and self-phase modulation in hybridly mode-locked Rh6G dye laser with a pair of Brewster prisms**  
Y.-S. Lim, G.-H. Kim, H.-J. Moon, C.-S. Go, J.-H. Lee and J.-S. Chang
- 1639 Surface plasmon-polariton study of the optical dielectric function of copper**  
D. J. Nash and J. R. Sambles
- 1649 Solitary waves of Maxwell's equations in nonlinear anisotropic media**  
Y. Chen and J. Atai
- 1659 The calculation of correlation functions in the quantum-state diffusion model**  
D. G. Sondermann

- 1665 Fringe contrast in two-colour holography in the presence of a transparent test medium**  
C. S. Vikram, W. K. Witherow and J. D. Trolinger
- 1677 Coupling in dielectric waveguide systems**  
H. Cory and E. Segall
- 1695 Mueller-matrix ellipsometry on electroformed rough surfaces**  
S. Krishnan
- 1707 A general scalar solution for the half-plane problem**  
S. Ganci
- 1713 Optically active absorptive Fabry-Pérot etalon**  
I. J. Lalov and E. M. Georgieva
- 1725 Detailed study of quasi-bound modes in leaky structures**  
S. P. Pogossian and H. Le Gall
- 1741 Generation and properties of superpositions of displaced Fock states**  
H. Moya-Cessa

### No. 9 September 1995

#### *Papers*

- 1755 Lifetimes of chaotic attractors in a multidimensional laser system**  
C. L. Pando Lambruschini and H. A. Cerdeira
- 1765 Coherence properties of synchrotron radiation in the space-frequency domain**  
D. Faklis and G. M. Morris
- 1785 On the limitations of the confocal scanning optical microscope as a profilometer**  
J. F. Aguilar and E. R. Méndez
- 1795 An evaluation of synthetic aperture radar noise reduction techniques for the smoothing of electronic speckle pattern interferometry fringes**  
A. Davila, G. H. Kaufmann and D. Kerr
- 1805 Harmonic generation by strongly driven classical anharmonic oscillators**  
L. Lo Cascio, T. Ménis and A. Maquet
- 1815 Phase space representation of modes in optical waveguides**  
D. Dragoman
- 1825 Analytical and numerical examination of the quantitative imaging properties of optical diffraction tomography**  
T. C. Wedberg and J. J. Stamnes
- 1837 On the Kramers-Kronig relation for the phase spectrum**  
P. L. Nash, R. J. Bell and R. Alexander
- 1843 Recent results in the Mie theory**  
Y. I. Granovskii and M. Ston
- 1853 A novel technique for spatial phase-shifting interferometry**  
M. Servin and F. J. Cuevas

- 1863 Design of a holographic concave grating used as a multiplexer/demultiplexer in dense wavelength-routed optical networks with subnanometer channel spacing**  
A. Stavdas, J. E. Midwinter, P. Bayvel and C. Todd
- 1875 Polarization effects in heterodyne interferometry**  
J. M. De Freitas and M. A. Player
- 1901 Computer reconstruction of a random rough surface in the presence of higher diffraction orders**  
M. Burova and J. Burov
- 1909 Digital techniques for strain measurement using electro-optic holography**  
G. K. Bhat
- 1921 Three-dimensional optical transfer function for weak aberrations**  
C. J. R. Sheppard and M. Hole
- 1929 Two-colour dynamic light scattering**  
P. N. Segrè, W. Van Megen, P. N. Pusey, K. Schätzel and W. Peters
- 1953 Optical soliton propagation in a coupled system of the nonlinear Schrödinger equation and the Maxwell-Bloch equations**  
K. Porsezian and K. Nakkeeran

#### No. 10 October 1995

##### *Letters*

- 1959 Spectral filtering effect of fused fibre couplers in femtosecond fibre soliton lasers**  
A. Boskovic, S. V. Chernikov and J. R. Taylor
- 1965 Enhancement of phase modulation detection sensitivity in ring photorefractive configurations**  
L. Jimenez, J. Sanchez Mondragon and S. Stepanov

##### *Papers*

- 1971 Beam splitter model of two-beam coupling in photorefractive materials**  
J. M. Yarrison-Rice, P. R. Rice and D. J. Rowan
- 1985 Polarimetric study of degenerate four-wave mixing with folded boxcars geometry in isotropic medium**  
S. K. Saha
- 1991 Field quantization and radiative processes in dispersive dielectric media**  
P. W. Milonni
- 2005 Temporal response of semiconductor travelling wave optical amplifiers to an exponentially varying input signal**  
R. Balasubramanyam, J. Sarma and K. A. Shore
- 2017 Contrast enhancement of Gaussian speckles produced by centrosymmetrical objects**  
K. Uno, J. Uozumi and T. Asakura

- 2041 Optical intensity filters for pattern recognition**  
S. Chang, P. Gagné and H. H. Arsenault
- 2051 High-intensity effects in self-pumped photorefractive phase conjugation using nanosecond pulses**  
M. J. Damzen, N. P. Barry and M. Buttinger
- 2059 Fast coherence scanning interferometry for measuring smooth, rough and spherical surfaces**  
R. Windecker, P. Haible and H. J. Tiziani
- 2071 Quantum statistical properties of mixed degenerate and non-degenerate parametric processes**  
J. Peřina and J. Bajer
- 2081 Comparison of two-dimensional Fraunhofer approximation and two-dimensional Fresnel approximation at analysis of surface roughness by angle speckle correlation. II. Experimental results**  
M. Ohlidal
- 2095 Third-order nonlinear optical properties of ethylenic tetrathiafulvalene derivatives**  
B. Sahraoui, M. Sylla, J. P. Bourdin, G. Rivoire, J. Zaremba, T. T. Nguyen and M. Sallé
- 2109 Carrier-modulated object step-loading method of automated analysis in digital speckle shearing interferometry**  
T. W. Ng
- 2119 Study of photon antibunching in the vacuum field two-photon Jaynes-Cummings model without the rotating-wave approximation**  
Xie Ruihua, Xu Gong-Ou and Liu Dunhuan
- 2127 Micromaser with two-photon absorber**  
K. Ellinger and H. Ritsch
- 2153 The local electric field in photorefractive and other semi-insulating materials. A Debye-Huckel type approach**  
D. Statman

#### No. 11 November 1995

##### *Letters*

- 2159 Three-step diffused surface waveguides for fabricating and designing integrated optical components**  
X. Prieto, C. Montero and J. Liñares
- 2165 Reconstructing the wavefunction in quantum optics**  
J. A. Vaccaro and S. M. Barnett

##### *Papers*

- 2173 Analysis of anisotropic thin film parameters from prism coupler measurements**  
H. Wang
- 2183 Tomography of atom beams**  
U. Janicke and M. Wilkens
- 2201 Surface electromagnetic waves at the interface with anisotropic media**  
J. M. Simon and V. A. Presa

- 2213 Ionization spectra induced by phase-varying fields**  
P. M. Radmore, S. Tarzi and K. L. Tang
- 2229 Near diffraction limited output from a 100 ns XeCl laser fitted with a phase-unifying-cavity**  
V. B. Kaul', S. V. Mel'Chenko, M. R. Perrone, A. Piegari and V. F. Tarasenko
- 2239 Photon conversion among multichromatic waves in two-level atom systems**  
Y. B. Xie
- 2255 A simple method for calculating scattering patterns of light from optical fibres**  
H. Wang
- 2265 An inverse scattering method in resonant optical problems with external triggering**  
M. G. Benedict and I. Németh
- 2275 Holographic array illuminator using tandem Michelson interferometers: fabrication and analysis**  
S. Bhattacharya, P. Senthilkumaran, J. S. Darlin, M. P. Kothiyal and R. S. Sirohi
- 2285 The distributed feedback of counter-propagating waves in a periodically modulated medium with relaxing cubic nonlinearity**  
A. A. Afanas'ev, B. A. Samson and E. G. Tolkacheva
- 2295 Dynamics of a gain anisotropic optically pumped laser with arbitrary angle between linear polarizations of pump and laser fields**  
A. M. Kul'minskii, R. Vilaseca and R. Corbalán
- 2309 Fraunhofer diffraction from apertures bounded by regular fractals**  
J. Uozumi, Y. Sakurada and T. Asakura
- 2323 Collision of two real dark spatial solitons**  
G. E. Torres-Cisneros, R. J. Romero-Troncoso, J. J. Sánchez-Mondragón and E. Alvarado-Méndez
- 2329 Study of the spectral resolution in time-delayed laser-induced double gratings**  
Zuhe Yu, Xin Mi, Qian Jiang and Panming Fu
- 2337 Non-classical light in nonlinear symmetric and asymmetric couplers**  
J. Peřina and J. Bajer
- 2347 Statistics of rough surfaces via remote sensing. An experiment**  
J. Alvarez-Borrego and A. Martínez
- 2357 White-light phase-stepping interferometry: measurement of the fractional interference order**  
P. Hariharan and M. Roy
- 2361 Nonlinear coefficients and the effective area of cross-phase modulation coupling of LP<sub>01</sub> optical fibre modes**  
A. D. Boardman, A. Shivarova, S. Tanev and D. Ziapkov

## No. 12 December 1995

*Papers*

- 2373 **Comment on 'The fractional Fourier transform in optical propagation problems'**  
S. Abe and J. T. Sheridan
- 2379 **Reply to the comment on the fractional Fourier transform in optical propagation problems**  
T. Alieva, V. Lopez, F. Agullo-Lopez and L. B. Almeida
- 2385 **The mutual interference of modes of a few-mode fibre waveguide analysed in the frequency domain**  
P. Hlubina
- 2401 **Spatial modifications of Gaussian beams reflected at isotropic-uniaxial interfaces**  
R. A. Depine and N. E. Bonomo
- 2413 **Effects of group-velocity dispersion on the evolution of optical pulses in a mode-locked laser using a single SHG crystal**  
Shaolin Xue and Qihong Lou
- 2425 **The Kramers-Henneberger potential for an electron in a strong field**  
P. P. Corso and F. Persico
- 2435 **Renormalization of the Buchdahl-Rimmer third- and fifth-order geometric aberration coefficients to rms wave aberration function expressions**  
M. Rosete-Aguilar and J. Rayces
- 2447 **Holographic interference by meshwork plates**  
Jiangang Xia, Chengzhang Yu, Xinling Zhao, Jingzhen Li and Ting-Chung Poon
- 2453 **Perfectly conducting lamellar gratings: Babinet's principle and circuit models**  
L. C. Botten, R. C. McPhedran and G. W. Milton
- 2475 **Quantum superpositions of binomial states of light**  
A. Vidiella-Barranco and J. A. Roversi
- 2495 **Beyond diffusion to diffraction**  
A. S. McLean and J. B. Pendry
- 2533 **Polarization effects and their minimization in an infrared single-mode fibre-optic double-Fourier stellar interferometer**  
P. Zhao, J.-M. Mariotti, V. Coudé du Foresto, P. Léna and F. Reynaud
- 2551 **Preparation and erasure of ordered electron-hole states in chalcogenide-type glasses**  
B. P. Antonyuk, S. F. Musichenko and V. B. Podobedov
- 2561 **Effects of phase fluctuations in the atom-field coupling coefficient of the Jaynes-Cummings model**  
A. Joshi

*Short Communication*

- 2571 **Extension of a diffusion model for holographic photopolymers**  
Guoheng Zhao and P. Mouroulis

**2575 Index of Authors****iii List of contents**

## **Aims and Scope**

The *Journal of Modern Optics* aims to publish original contributions to optical knowledge from educational institutions, government establishments and industrial R&D groups world-wide. The whole field of classical and quantum optics is covered. Papers may deal with the applications of the fundamentals of modern optics, considering both experimental and theoretical aspects of contemporary research, for example

**Diffraction**

**Free and guided propagation**

**Interference**

**Optical coherence**

**Polarization**

**Scattering**

**Photon statistics**

**Quantum optics**

**Lasers**

**Nonlinear optics**

**Bistability**

**Phase conjugation**

**Harmonic generation**

**Image formation**

**Image evaluation**

**Image processing**

**Holography**

**Speckle**

**Optical materials**

**Thin films and multilayer coatings**

**Fibre optics and sensors**

**Integrated optics**

**Electro-optics**

**Physiological optics**

**Colorimetry**

**Optical metrology**

**Optical design and techniques**

**Optical instrumentation**

**Optical production technology**

**Optical system testing**

## **Types of contribution**

Contributions must report original research not previously published or being considered elsewhere. They are subject to review by referees. Papers may be written in English, French or German.

**Papers:** Full-length papers are not normally of more than 8000 words (or about 25 typed pages). Submissions are assessed by two independent referees and publication can

normally be expected within 9 months of submission.

**Letters:** Short papers on timely and important topics where rapid publication is desirable are normally assessed by a member of the Board, and if accepted are published within 10–14 weeks of submission. Letters should not exceed 1800 words (or about 7 typed pages).

**Short contributions:** Papers of about 4 typed pages dealing with preliminary results or technical advances will also be considered.

## **Preparation of manuscripts**

**Manuscripts** should be typed in double spacing, preferably on A4 (210 × 297 mm) plain paper. Tables and figure captions should be prepared on separate sheets, placed at the end of the paper.

**Section headings** should be concise and numbered sequentially, using a decimal system for subsections.

**References** should be cited using the numerical system (e.g. [3], [5–9]). They should be listed separately at the end of the paper in the order in which they appear in the text.

**Figures** should be prepared to the highest standard. Line figures should be complete with all lettering using a draughtsman's stencil and ink or dry-transfer lettering. Photographs for half-tone reproduction should be on gloss paper. All figures should be clearly identified.

## **Submission information**

Three copies of the manuscript, each with a complete set of illustrations, together with one set of high-quality line drawings and/or photographs should be sent to: Professor P. L. Knight, Journal of Modern Optics, Blackett Laboratory, Imperial College, London SW7 2BZ, U.K. (tel: (171) 594 7727, fax: (171) 823 8376) or Professor R. W. Boyd, The Institute of Optics, University of Rochester, Rochester, NY 14627, U.S.A. (tel: (716) 275 2329, fax: (716) 273 1075).

**There are no page charges and the sole or principal author receives 50 offprints free of charge.**